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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,524	05/30/2001	Tomoki Kobayashi	IIW-002	1359

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EXAMINER	
CREPEAU, JONATHAN	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/870,524	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	Jonathan S. Crepeau	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13,17 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13,17 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *10* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-11, 13, and newly added claims 17 and 18. Claims 1-11 and 13 remain rejected, and claims 17 and 18 are newly rejected for substantially the reasons of record. Accordingly, this action is made final.

Claim Rejections - 35 USC § 103

2. Claims 1-11, 13, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voss et al (U.S. Patent 6,106,964) in view of Reiser (U.S. Patent 6,497,971).

Regarding claims 1, 13, 17, and 18, Voss et al. is directed to a method for controlling the temperature of an oxidant supply gas to be supplied to a fuel cell (see col. 4, line 11). The method comprises the step of introducing the supply gas into a heat exchanger, and at the same time, introducing an exhaust gas discharged from the fuel cell into the heat exchanger to perform heat exchange between the gases (see col. 4, lines 15-28; Fig. 2). Regarding claim 8, the reference teaches that the heat exchanger is a water-permeable membrane type humidifier (see col. 5, lines 32-52).

Voss et al. do not expressly teach a compressor functioning as a temperature control device located downstream of the fuel cell which compresses the exhaust gas, as recited in claims 1, 13, 17, and 18.

The patent of Reiser is directed to a fuel cell assembly in which blowers (i.e., compressors) 17A, B are located downstream of the cell stacks and suck oxidant reactant therethough (see Fig. 6; col. 7, lines 19-24).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the fuel cell assembly of Reiser in the system of Voss et al. In column 2, line 26, Reiser teaches that an object of his invention is "to provide improved methods and apparatus for the delivery of input reactants to fuel cells." Accordingly, the artisan would be motivated to use the fuel cell assembly of Reiser in the system of Voss et al. Regarding claims 13, 17, and 18, the blowers of Reiser would inherently function to control (i.e., increase) the temperature of the oxidizing exhaust gas of Voss et al. before it is introduced into the heat exchanger.

Regarding instant claims 2 and 9, which recite that a controller controls the pressure of the exhaust gas to be incorporated into the heat exchanger, the blower of Reiser would also inherently perform this function. Regarding claims 3 and 4, which recite that the controller is controlled depending on the "demand" temperature of the supply gas, Reiser also fairly suggests this limitation. Reiser teaches in column 3, line 21 that "the method can also include determining a temperature characteristic of the fuel cell stack assembly and controlling the blower responsive to the temperature." The disclosed "temperature characteristic of the fuel cell stack" fairly suggests the reactant input temperatures. Accordingly, claims 3 and 4 would be rendered obvious.

Regarding claims 5 and 6, which recite that the pressure of the exhaust gas is increased when the temperature of the supply gas is lower than the demand temperature and vice verse, Reiser also fairly suggests these limitations. In column 3, line 24, the reference teaches that "the step of controlling can include increasing the flow of the oxidizer when the temperature is below approximately a selected temperature and reducing the flow rate when the temperature is above approximately a[t] selected temperature." Since increased flow rate corresponds to increased pressure, the subject matter of claims 5 and 6 would be rendered obvious.

Regarding claim 7, the assembly of Reiser also comprises a control valve (53B, 56B; see Fig 6), which would also function to control the pressure of the exhaust gas to be incorporated into the heat exchanger of Voss.

Regarding claims 10 and 11, which recite that the pressure controller is controlled depending on the target humidity of the supply gas, Reiser also fairly suggests this limitation. In column 2, line 67, Reiser teaches that "the delivery of oxidizer [can be controlled] by the blowers responsive to the sensors. Sensors can be of several types and can include sensors for sensing temperature, voltage, current, oxygen concentration and humidity." This would fairly suggest to the artisan that the blower can be controlled based on the humidity of the supply gas. Accordingly, the subject matter of claims 10 and 11 would also be rendered obvious.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 2, 8, 13, 17, and 18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 09/908,204 (U.S. Pre-Grant Publication No. 2002/0034669) in view of Voss et al. The '204 application claims recite all the claim limitations except the presence of a compressor *per se*, that the compressor controls the temperature and pressure of the exhaust gas, and the presence of a membrane-type humidifier for exchanging heat and humidity between supply and exhaust streams. As noted above, Voss et al. is directed to a membrane humidifier. In column 3, line 55, Voss et al. teach that their humidifier is "a simpler and more energy efficient means for pre-heating an humidifying reactant supply streams in a solid polymer fuel cell system[s]." Accordingly, an artisan would be sufficiently motivated to use such a humidifier in the system of the '204 claims. Furthermore, the "gas-sucking means" recited in the '204 claims suggests the instantly claimed compressor. Such compressor would inherently perform the control of the temperature and pressure of the exhaust gas as also recited in the instant claims. Accordingly, the instant claims define an obvious variation of the '204 claims.

This is a provisional obviousness-type double patenting rejection.

5. Claims 1-11 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of copending Application No. 09/801,312 (U.S. Pre-Grant Publication No. 2001/0021468) in view of Reiser. The '312 claims recite a water-permeable type humidifier which transfers water from an exhaust stream to a supply stream. It is not expressly recited that that heat is also transferred, but this feature would be inherent in the humidifier of the '312 claims. The '312 claims also do not recite a compressor downstream of the fuel cell. However, as set forth above, Reiser teaches this feature, and motivates the artisan to include such a compressor in the system of the '312 claims. Accordingly, the instant claims define an obvious variation of the '312 claims.

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

6. Applicant's arguments filed August 6, 2003 have been fully considered but they are not persuasive. With respect to the Reiser reference, Applicants assert that the reference "clearly does not teach or suggest compressing exhaust gas to increase the exhaust gas temperature. The blowers 17A and 17B draw oxidant gas from the fuel cell, but do not *compress* exhaust air, as recited in independent claim 1." In response, it is submitted that the blowers of Reiser would in fact "compress" the exhaust gas. The first sentence of section 3.3D of Geankoplis, cited herewith, states that "[i]n blowers and compressors pressure changes are large and compressible flow occurs." Thus, it is submitted that the exhaust gas of Reiser would in fact be "compressed"

by the blower. Therefore, regarding claim 1, since the blower of Reiser compresses the exhaust gas, it would at least be functionally equivalent to the "compressor" recited in the claim, even in the event that the two terms are not considered to be synonymous.

Regarding the assertion that "[t]he Reiser reference does not teach or suggest controlling the temperature of an exhaust gas," the Examiner maintains the position that the temperature would be inherently controlled (increased) during adiabatic compression. See Equation 3.3-15 of Geankoplis.

Applicants further assert that "[t]he Reiser reference only describes altering the flow rate of an exhaust gas using a blower depending on the temperature of the exhaust gas, not a supply gas." However, the Reiser does contain any teaching that the exhaust gas temperature is monitored. In fact, Reiser is silent regarding the monitoring of temperature of the supply or exhaust gases. However, in column 6, line 27, the reference teaches the following with regard to the sensors in the system:

> FIG. 4 illustrates a cell stack assembly 10 and a controller 50 for controlling the blowers 17A and 17B responsive to sensors 52A and 52B. The sensors 52A and 52B can be temperature sensors, or can sense other operating parameters, or operating characteristics, relevant to the operation of the fuel cell stack assembly 10. An operating parameter, or characteristic, is any information that is useful for controlling the operation of the fuel cells via controlling one or more of the blowers 17. Accordingly, useful sensors can include temperature sensors, voltage sensors, oxygen sensors and humidity sensors. Sensors may be located within the cell assembly, such as within the inner volumes defined by the manifolds, or within or adjacent an individual fuel cell 13. Sensors can be located elsewhere within the fuel cell power plant. The sensor 52A primarily senses that portion of cell stack assembly 10 that is provided oxidant flow by the blower 17A, while the sensor 52B senses that portion of the cell through which the blower 17B flows oxidant. Sensors can also be disposed in the window, as indicated by sensor 52C. The window 58 can include an air filter 53 and a valve, such as louvers 56, controlled by a control mechanism, such as the solenoid 54, that controls the air flow through the window 58 responsive to the controller 50.

The teachings that the sensors can be located in the various manifolds or "elsewhere within the fuel cell power plant" provide sufficient guidance for the artisan to use a temperature sensor in the oxidant supply or oxidant exhaust stream. Accordingly, the recitation of a temperature sensor in the oxidant supply stream is still considered to be fairly suggested by the Reiser reference.

Applicants further assert that "[t]he Voss reference does not describe or suggest a motivation for or a benefit to including a compressor in the system described therein." In response, it is submitted that Voss is not required to teach the motivation for including a compressor in its system. The motivation for doing so is found in Reiser, which has been explained above. Further, in alleging hindsight, Applicants state that "[t]he Examiner has not provided an objective reason to combine the teachings of the references to support his statement that it would have been obvious to combine the Voss reference with the Reiser reference." In response, the objective reason to combine the references is found at column 2, line 26 of Reiser: "it is an object of the invention to provide improved methods and apparatus for the delivery of input reactants to fuel cells."

Regarding the obviousness-type double patenting rejection over the '204 application, Applicants assert that several features recited in the instant claims are not recited in the '204 claims, namely a heat exchanger and the step of exchanging heat between the supply and exhaust streams. However, the Voss reference teaches these features, and as noted above, motivates the artisan to use them in the system of the '204 application claims. Furthermore, Applicants state that "[t]he claims of Application No. 09/908,204 also recite certain features not found in the

claims of the present application." However, the additional features recited in the '204 claims are not germane to the outstanding rejection because only a one-way determination of obviousness is required. See MPEP §804 (II)(B)(I)(a). Accordingly, the obviousness-type double patenting rejection over the '204 application is deemed to be proper and is maintained herein. Similar arguments apply to the obviousness-type double patenting rejection over the '312 application and that rejection is also maintained herein.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

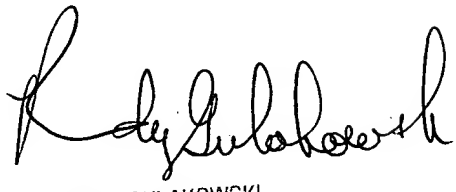
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (703) 308-4333. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

October 7, 2003



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